CAMOSUN

Name: _____

Mark: ____ / 25

MATH 101 (Fall, 2026)

Test 2

1. (4 marks) Use partial fractions to integrate $\displaystyle\int \frac{x+1}{x^2-6x+9}\,dx$.

2. (3 marks) Integrate $\displaystyle\int \sec 2x \tan^3 2x\,dx$.

3. (5 marks) Evaluate the definite integral $\int_0^{\sqrt{2}} \sqrt{4 - x^2}\, dx$.

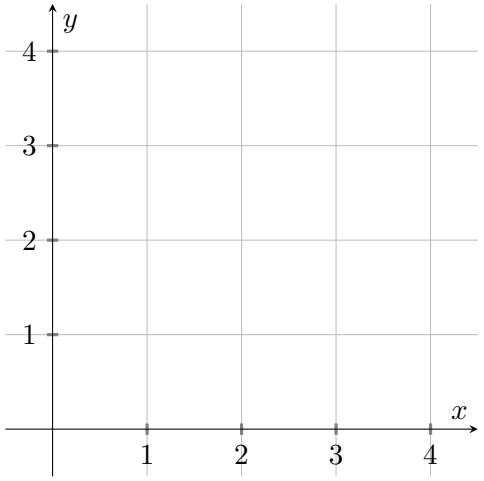
4. (3 marks) Integrate by parts by letting $u = 1 - \ln x$ and simplify your answer.

$$\int \frac{1 - \ln x}{x^2}\, dx$$

5. (3 marks) Evaluate the limit $\lim_{x \to 0^+} (\sin x + \cos x)^{1/x}$.

6. Consider the region in the first quadrant bounded by the curves $y = \sqrt{4 - x^2}$, $x = 0$ and $y = 0$.

   (a) (2 marks) Sketch and shade the region.



   (b) (1 mark) Find the area of the region by using a geometry formula (not integration).

   (c) (4 marks) Using your answer from part (b), find the y-coordinate, $\overline{y}$, of the centroid of the region.